UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,658	07/25/2003	Yukihiko Furumoto	826.1884	1396

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EXAMINER
GOETZ, PHILIP S

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	10/626,658	FURUMOTO ET AL.
	Examiner	Art Unit
	Philip Goetz	2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 July 2003</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-10</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-10</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>25 July 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claim 9 objected to because of the following informalities: The words spelled as

"dimentional" and "inofmration" are misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3.   Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing

to comply with the enablement requirement. The claim(s) contains subject matter that

was not described in the specification in such a way as to enable one skilled in the art to

which it pertains, or with which it is most nearly connected, to make and/or use the

invention.

Claims 2 and 7 refer to detecting "interference between objects". This phrase is

used repeatedly throughout the specification, but is never defined. One guess is that it

is intended to mean interpenetration between objects. If so, this should be explicitly

stated. However, no method is provided for detecting collisions between objects. Even

detecting between rigid solid bodies is difficult (and not enabled by the disclosure).

Detecting collisions between objects such as liquids; hair, fur, or grass; fabrics; objects

with rapidly-moving parts; gases; and trees, animals, and other organic forms, is more

complicated, and not enabled by the disclosure.

Supposing that a method for detecting interference between objects were enabled, there would be an infinite number of ways to avoid that interference for each such interference. The disclosure attempts to address how to choose or generate a way to avoid an interference on pages 46 through 49, but no algorithm is provided, nor any motivation for why the system chose to move the keyboard in the directions that it did, in the order that it did.

Claims 3 and 8 refer to a "discontinuity detecting unit", and a unit capable of generating a scene to smoothly transition between the discontinuous scenes. The specification indicates this to refer to two frames in which a single object is displaced by a distance greater than some threshold between the two frames. No method is given for detecting other types of discontinuities, such as objects appearing or disappearing. Many realistic events appear or are physically discontinuous; for instance, foods being eaten, evaporation or condensation, glass shattering, a balloon popping, a light being turned on or off, salt dissolving in water, or the pulling apart of two identically-colored blocks that appeared to be a single object.

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5.   Claims 5 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 5 and 10 refer to an operation instruction editing unit that avoids an operation that violates a set of rules. It must be clarified how this set of rules is distinct from the set of rules embodied in any user interface that by its

nature permits only a subset of the set of all conceivable operations. Applicant must also clarify how an editing rule differs from the constraints between objects referred to in claims 4 and 9. Also, the example of an editing rule given on p. 50 of the application is of a user attempting to perform a forbidden operation, in which case a new operation allowing the forbidden operation is inserted before the requested operation. This approach amounts to automatically disabling all editing rules, and hence does not enable the useful application of editing rules. A more specific embodiment, such as a STRIPS-based system for achieving preconditions, is needed to enable the invention.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7.   Claims 1 and 6 are rejected under 35 U.S.C. 102(a) as being anticipated by Espinosa-Aguilar et al. Espinosa-Aguilar et al. is one of many books that describe 3D Studio Max, a popular software package that creates and stores three-dimensional models (see p. 5), to configure images of animation using three-dimensional model information, and to create or edit an animation by generating or editing an operation instruction sequence (see p. 16), including object operation instructions and eye point operation instructions (operations that alter the eye point from which a scene is rendered; see p. 649).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2, 4, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espinosa-Aguilar et al. as applied to claims 1 and 6 above, and further in view of Lander et al. Lander et al. describe three physics engines for three-dimensional animation, all of which perform collision detection to detect interpenetration between objects, and which prevent such interpenetration by making the objects stop their movements or rebound off each other, according to their simulated physical properties. They also all detect violation of constraints including but not limited to the connections of objects at joints, and restrictions of the axis of said joints around which rotation can take place, and they all prevent violation of said constraints by computing actions consistent with the laws of physics and the properties of said objects under said constraints. It would have been obvious at the time the invention was made to one of ordinary skill in the art to combine the animation system described in Espinosa-Aguilar et al. with any one of the physics engines described in Lander et al., because those physics engines were designed to take models created by the system described in Espinosa-Aguilar et al.

10.   Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espinosa-Aguilar et al. as applied to claims 1 and 6 above, and further in view of Witkin et al. and Hoppe et al. Applicant claims a discontinuity-detecting unit to detect the occurrence of discontinuous scenes, and an instruction-generating unit to generate object operation or eyepoint operations to generate a scene transitioning between the continuous scenes.

Hoppe et al. describe a method to detect discontinuities in the motions of objects in animations, based on using pixel color values, the object identification buffer, and the Z-buffer (see Hoppe et al., section 4, "Animation analysis", subsections 4.1, "Requirements", and 4.3, "Discontinuity in motion").

The technique described on page 31 to generate a scene transitioning between the continuous scenes amounts to using linear interpolation to fill in intermediate positions. Witkin et al. describe a more general approach of generating frames to fill in discontinuities with additional constraints, such as obeying the animated character's joint constraints and user-imposed constraints such as the force or height of a jump to be generated, all according to the law of gravity and other laws of physics. Filling in the gap between the start and end of a discontinuity is known in the art as the two-point boundary problem (Witkin et al. p. 160). See Witkin et al. p. 160: "The spacetime formulation permits the imposition of constraints throughout the time course of the motion, with the effects of constraints propagating freely backward as well as forward in time. Constraints on initial, final, or intermediate positions and velocities directly encode the goals of the motion, while constraints limiting muscle forces or preventing

interpenetration define properties of the physical situation.... Solving this constrainted

optimization problem yields optimal, physically valid motion that achieves the goals

specified by the animator."

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to combine a variant of the discontinuity-detecting method of Hoppe et al.

with the discontinuity-filling method of Witkin et al., and to embody this combination in

an animation-editing package such as that described in Espinosa-Aguilar et al.,

because an animation-editing package creates an animation, discontinuity-detecting

shows a form of damage or error in said animation, and discontinuity-filling repairs or

corrects it. The discontinuity-detecting method of Hoppe et al. would need to be

modified to detect discontinuities before rendering, when complete object information

was still available, but this would be trivial, since the problem is much easier before

rendering.

11.   Claims 3 and 8 are rejected under 35 U.S.C. 102(a) as being unpatentable over

Espinosa-Aguilar et al. as applied to claims 1 and 6 above, and further in view of

Matsuda et al. Applicant claims the animation creating/editing apparatus of claims 1

and 6, further limited by a discontinuity-detecting unit to detect the occurrence of

discontinuous scenes, and an instruction-generating unit to generate object operation or

eyepoint operations to generate a scene transitioning between the continuous scenes.

Espinosa-Aguilar et al. teach an animation creating/editing apparatus, but the provided

sections of Espinosa-Aguilar et al. do not teach discontinuity-detection and correction.

Matsuda et al. describe a discontinuity-detecting ability to detect the occurrence of

discontinuous transitions in an animation, and to smooth out said discontinuities.

Matsuda et al. paragraph 9 reads in part: "In order to ensure a good connectivity

between the animation parts, the attribute values of the expression, the states of eyes

and mouth, and the direction of face at the final frame of the story step I must be equal

respectively to those at the first frame of the next story step II... In order to deal with

such a difference of the attribute values in the connection of the story steps I and II, the

present invention changes the attribute values so as to automatically obtain the same

attribute values, to thereby perform reselection of the animation parts." It would have

been obvious at the time of the invention to one of ordinary skill in the art to combine the

three-dimensional animation creating/editing apparatus of Espinosa-Aguilar et al. with

the two-dimensional animation creating/editing apparatus and discontinuity-detecting

and discontinuity-correcting apparatus of Matsuda et al., because this would result in

reduced discontinuities for an improved animation display. Also, Matsuda et al. is

written as an action that takes place inside an animation creating/editing apparatus,

albeit one that may be used with two-dimensional rather than three-dimensional

animations, for smoothing out discontinuities.

12.   Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Espinosa-Aguilar et al. as applied to claims 1 and 6 above, and further in view of Coyne

et al. Coyne et al. developed a system for generating animation from text descriptions,

which included a mechanism for using rules to describe semantically likely scenes,

detecting when these rules were violated, and correcting the animation to observe the

rules. See section 4, "The Depiction Process", with particular reference to subsections

4.2, "Implicit Constraints", and 4.3, "Conflicting Constraints". It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the three-dimensional animation creating/editing apparatus of Espinosa-Aguilar et al. with the animation scene-rule-storing and rule-checking apparatus of Coyne et al., because the animation scene-rule-storing and checking apparatus requires a three-dimensional model-creating apparatus such as that described in Espinosa-Aguilar et al. to be used to create models for it.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Goetz whose telephone number is (571) 272-2910. The examiner can normally be reached on that number from 9AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan, can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Examiner name: Philip Goetz

Date: August 22, 2005

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